

## **Briefing Note for the open-ended informal working group of the Council on the financial terms of contracts**

Prepared by the Chair of the Working Group

### **I. About this briefing note**

1. The main purpose of this briefing note is to build on the outcomes of the first meeting of the working group (February 2019) to help facilitate further discussion and to advance the adoption of a payment mechanism, associated rates of payment and the basis on which financial terms will be prescribed for under a future exploitation contract.
2. This briefing note:
  - (a) Presents three options for a payment mechanism for consideration by the working group;
  - (b) Summarises the assumptions made in connection with environmental aspects of the model; and
  - (c) Presents other matters relating to the payment mechanism for consideration by the working group.
3. This note should be read in conjunction with the Massachusetts Institute of Technology's *Report to the International Seabed Authority on the Development of an Economic Model and System of Payments for the Exploitation of Polymetallic Nodules in the Area*, dated 31 March 2019.<sup>1</sup> In February 2019, during the first meeting of the informal working group, MIT experts also presented their findings on the comparison of four economic models.<sup>2</sup>

### **II. Economic model developed by the Massachusetts Institute of Technology: Review of options**

#### *Introduction*

4. This section presents a discussion on the options available for the payment mechanism and associated rates of payment, including the results modelled by MIT based on the following options:
  - (a) Fixed-rate ad valorem only royalty mechanism;
  - (b) Two-stage ad valorem only royalty mechanism; and
  - (c) A combined ad valorem royalty and profit-based system.
5. These options are in line with the 1994 Agreement that requires the Authority to consider using a royalty system or a combination of a royalty and profit-share system. An analysis of the characteristics of these payment types (ad valorem royalty and profit share) is shown at Appendix I, which also contains a broad assessment of the different options against the objectives and principles of the Convention and 1994 Agreement.

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<sup>1</sup> Available at <https://ran-s3.s3.amazonaws.com/isa.org.jm/s3fs-public/files/documents/paysysmodel-3jun.pdf>. See also MIT presentation to the working group on results and recommendations, available at [https://ran-s3.s3.amazonaws.com/isa.org.jm/s3fs-public/files/documents/dec-analysis\\_0.pdf](https://ran-s3.s3.amazonaws.com/isa.org.jm/s3fs-public/files/documents/dec-analysis_0.pdf).

<sup>2</sup> MIT, *Financial Regimes for Polymetallic Nodule Mining: A Comparison of Four Economic Models*, January 2019, available at <https://ran-s3.s3.amazonaws.com/isa.org.jm/s3fs-public/files/documents/mit.pdf>. See also MIT presentation to the working group: *Financial Regimes for Polymetallic Nodule Mining: A Comparison of Four Economic Models*, available at [https://ran-s3.s3.amazonaws.com/isa.org.jm/s3fs-public/files/documents/model\\_comparisons\\_0.pdf](https://ran-s3.s3.amazonaws.com/isa.org.jm/s3fs-public/files/documents/model_comparisons_0.pdf).

6. The MIT model tests revenue shares to the Authority (using the above options), the mining operator (investment return) and sponsoring States (assumed taxes payable). The model assumes a threshold value for the “commercial viability” of a mining operation where the internal rate of return (IRR) of that operation is in a range of 17-18%.

7. Appendix II to this note presents a table showing different scenarios under the three options identified in paragraph 4 above, using results extracted from the MIT report where the IRR to the contractor is in the range of 17-18%. The following conclusions can be drawn:

- (a) Using the assumptions in the MIT model a fixed-rate royalty does not produce optimum revenues for the Authority when compared with other alternatives;
- (b) At an 18% IRR, revenues to the Authority are disproportionately lower than at the 17% and 17.5% levels.
- (c) Under a 17.5% IRR, the two-stage ad valorem royalty approach (2% increasing to 6%)<sup>3</sup> performs marginally better than a combined ad valorem royalty and profit share. In securing optimum revenues to the Authority in the early stages of industry development, an assured and stable revenue stream would be preferable compared to the potential downsides of a profit-based mechanism.
- (d) Under the 17% IRR scenario, the results for the ad valorem royalty and ad valorem royalty and profit share combination are broadly equal. The model indicates a greater share for the Authority, however an 8% royalty at Stage 2 may be considered too high in the early stages of development, and detrimental to attracting investment to the Area.

*Rates of payment within the range: discussion*

8. While the 1994 Agreement stipulates that rates of payments to the Authority shall be within the range of those prevailing in land-based mining of the same or similar minerals, this principle is not straightforward to put into practice. Land-based rates vary substantially both at the level of headline rates and bases against which they are applied.

9. For example, while royalty rates are typically in a range of 4%-6%<sup>4</sup> these rates applied to either “gross sales”, “gross value”, “net sales”, “mine head value”, “average metal prices” with some linked to profitability. Deductions of transport, insurance and other marketing costs are also sometimes allowed in order to approximate an ex-mine value base. Rates may also depend the condition of the product (unrefined or refined).

10. The royalty calculation base used in the MIT model and reflected in appendix IV to the current draft regulations is a gross metal value. Under the MIT model a 2% and 6% ad valorem royalty based on gross metal values would, for example, translate to effective rates of approximately 4.8% and 14.2% respectively based on the nodule transfer price.

11. In land-based mining regimes, a total headline share, or indicative government take varies between 35 percent and 55 percent, including royalties, corporate income tax and additional profit/rent taxes. For mining operations in the Area, a minimum of two regulating and “taxing” entities will be involved, the Authority and the sponsoring State or States (and possibly a third State that hosts the processing plant). The table in Appendix II compares the (non-discounted) share of each party (Authority, sponsoring State, other share (environmental

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<sup>3</sup> Under the MIT model, the switching point between the Stage 1 and Stage 2 ad valorem royalty or commencement of any profit share is of the order of 5 years being a mining entity break-even point as calculated (full cost recovery). Other systems that incorporate financial performance-based triggers could be explored and modelled.

<sup>4</sup> See *A Discussion Paper on the Development and Implementation of a Payment Mechanism in the Area* issued by the ISA Secretariat in March 2015, available at <https://ran-s3.s3.amazonaws.com/isa.org/jm/s3fs-public/documents/EN/WorkingPapers/DiscussionPaper-FinMech.pdf>.

fund) and the collector share) expressed in percentages. In the case of a 2% and 6% ad valorem royalty, the collector share amounts to 56 percent, while the remainder of 44 percent is divided between the Authority, the sponsoring State and the fund, which is on par with an average land-based mining fiscal regime. It could be considered, therefore, that using this option would satisfy the requirement of the 1994 Agreement.

12. Nevertheless, another way of considering the value of the return to the Authority is to look at the effective social discount rate. This would reveal the present value of future income for the Authority. A lower social discount rate puts more emphasis on future generations, whilst a higher rate provides a greater immediate return. The table at Appendix II reflects a social discount range between 2.27% and 10%. In the event that the working group wishes to consider this aspect in more depth, an expert study could be commissioned to establish a justifiable and appropriate social discount rate.

#### *A transitional regime for the Authority and contractors*

13. The flexibility to fairly adjust and modify any mechanism as the industry grows and develops will be key to securing optimum revenues as well as ensuring that the system is fair both to a contractor and to the Authority. The early years of a financial regime should aim for stability, certainty, and predictability (time consistency) and balance the need for optimum and stable revenues to the Authority with the need to attract investment to the Area. In the short term, early entrants into the industry will face higher risks and high capital requirements for mine development than later entrants, with a possible downside to the Authority that a mining operation will produce but not make a profit or take longer than anticipated to make a profit. This suggests that it may be useful to consider a transitional mechanism, with a royalty in the early years, and a transition to a longer-term mechanism, which may include profit-sharing, once the industry has demonstrated its commercial viability and the Authority has a reasonable assurance that there will be profits to share.

### **III. Review of system of payments and rates of payments**

14. Draft regulations 81 and 82 provide for a review of the system of payments (i.e. the type of payment instrument (royalty, profit share, alternative)) and a review of the rates of payments. The text of these draft regulations is at Appendix III. Draft regulation 82 provides that the Council must review the rates of payments five years from the first date of commencement of commercial production in the Area and at intervals thereafter as determined by the Council.<sup>5</sup> In the case of exploitation contracts in existence as at the date of review, any adjustment can only be applied from the end of a second period of commercial production.

15. The MIT model assumes, in the case of a two-stage royalty, a first period of commercial production of five years. No provision is made for a rate adjustment during a second period of commercial production. This second period and rate review requires further consideration, not least in relation to the stability of revenues and certainty and predictability of the mechanism in making investment decisions.

16. In the short term, it is suggested that a time-based (see draft regulation 81(1)) or continual review process is preferable to allow the Council to understand the economics and commercial viability of the first phase of mining operations. For the medium to long term the Authority should establish a target benchmark against which to assess optimum revenues. For example, some regimes target a percentage of accounting profits and then adjust the mechanisms or rates to achieve this through a combination of fiscal instruments.

### **IV. Environmental aspects of the model**

17. A number of financial instruments are under consideration in connection with the protection of the marine environment, including: (1) the lodging of an environmental performance guarantee, principally in connection with closure obligations (draft regulation 26); (2) an obligation to maintain insurance (draft

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<sup>5</sup> This may include an adjustment to the actual royalty rates or the manner and basis of the calculation of a royalty.

regulation 36), which should include environmental liability insurance, and (3) mandatory contributions to an environmental compensation fund (draft regulation 54).<sup>6</sup>

18. The MIT model reflects the following considerations and costs:

- (a) Environmental assessment and monitoring costs borne directly by the contractor are factored into the model as a cost of operations; and
- (b) A contribution to an environmental fund is assumed, estimated at an amount equivalent to an additional 1% royalty, but capped at USD500m per project.

19. For the purposes of the model, the contribution to the environmental fund is intended to reflect the cost of maintaining a range of financial instruments including the environmental performance guarantee, insurance and an environmental compensation fund. The 1% amount is therefore indicative until such time that a substantive discussion of the individual components has taken place. It is included in the model simply in order to reflect the economic impact of such instruments and how they affect the profitability of the operation.

20. The approaches to be taken by the Authority to best achieve the desired environmental incentives through a mix of regulation, financial instruments and liability warrant closer examination. The rationale for such financial instruments, that they are fit for purpose and the appropriate size of such instruments needs to be determined. In the case of any insurance or compensation fund what type of loss or damage is to be covered? What could be the magnitude of that loss or damage? Consequently, what should be the appropriate size of any insurance and fund? Equally, the relationship between any proposed fund and the insurance market for environmental insurance policies will need to be closely looked at.

21. The working group is to take note that the Commission will continue to advance thinking as regards appropriate insurance schemes in the light of best international practice in related extractive industries and in conjunction with relevant stakeholders.<sup>7</sup> Additionally, the Commission will continue to explore the matters raised by report submitted by the legal working group on liability for environmental harm (see document ISBA/25/C/19 at para. 28).

## V. Other points for consideration

### *Sponsoring and other State taxes and charges*

22. The working group agreed previously that there was no need for a detailed discussion of the interaction between the payment mechanism of the Authority and the fiscal regimes of States, and that corporate taxes were a matter for the States concerned. It was also stated that those taxes would need to be reflected in the model as a cost for contractors. The MIT model assumes an effective rate of 25% in respect of State tax obligations, inclusive of any other fees payable. However, it is not known how States will treat payments to the Authority under national tax regimes (e.g. through a tax credit or full deduction mechanism). This will also vary by the different contractor reporting entities. The actual tax position at a national level may be considered at the time of a first review of the system and rates of payment and may be considered a factor in supporting such review.

### *Valuation and measurement*

23. The royalty revenue received by the Authority depends on the accurate pricing and measurement of the mineral-bearing ore to avoid any undervaluation of the constituent metals contained in the mineral ore. This is less of a risk where a value (on which a royalty is payable) is calculated according to a publicly quoted index

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<sup>6</sup> The purpose(s) of this fund remain under review (see draft regulation 55) as well as funding options (see draft regulation 56) following recent stakeholder submission to the draft regulations.

<sup>7</sup> Draft regulation 2(e)(iv) notes the “The application of the polluter pays principle through market-based instruments, mechanisms and other relevant measures”.

rather than a contractor reported value. The methodology adopted at appendix IV to the draft regulations seeks to establish such a value by reference to first a public index and secondly, where no listed price is available the price is to be determined by the Council.

24. That said, some undervaluation may arise depending on how the average grade of the constituent metals is determined, as well accurate measurement of the total quantity of mineral-bearing ore in metric tons at the point of transfer to a transport vessel in the form of a “slurry”.

25. The working group may wish to recommend that a measurement, valuation and reporting standard is drawn up based on international best practice, including a requirement for independent sampling and laboratory testing, to ensure a standardised approach and to reduce any possibility for undervaluation.<sup>8</sup>

#### *Date of commencement of commercial production*

26. Establishing the date of commencement of commercial production is key to triggering a royalty liability (draft regulation 64) and the payment of the annual fixed fee (draft regulation 85). A definition for commercial production is included in the draft regulations.<sup>9</sup> The wording mirrors the objective criteria contained in article 17 (2) (g) of annex III to the Convention. The working group may wish to consider whether a more explicit definition is required in order to avoid the potential for manipulation or misinterpretation, or whether this could be dealt with through *Guidelines on criteria for determining the date of commercial production*.

#### *Summary of payments and fees under the draft exploitation regulations*

27. As requested by the Council in February 2019, Appendix IV to this note presents a summary table of all fees and other payments reflected in the draft regulations.

## **VI. Other resource categories**

28. Discussion and modelling will also need to be advanced in relation to other resources types, namely seafloor massive sulphides and cobalt-rich ferromanganese crusts, as the approaches to mining each resource and relevant market characteristics are different to that of polymetallic nodules. The working group is invited to consider the timing of such modelling.

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<sup>8</sup> The draft regulations provide for certain information to be contained in a royalty return. In particular, draft regulation 71(1)(c) provides that: “The value and the basis of the valuation of the mineral -bearing ore sold or removed without sale from the Mining Area, as verified by a suitably qualified person and supported by a representative chemical analysis of the ore by a certified laboratory”. Additionally, reference is made to quality of assay data and laboratory tests in the Reporting standard of the International Seabed Authority for mineral exploration results assessments, mineral resources and mineral reserves (see Annex V to ISBA/21/LTC/15).

<sup>9</sup> “ ‘Commercial Production’ shall be deemed to have begun where a Contractor engages in sustained large-scale recovery operations which yield a quantity of materials sufficient to indicate clearly that the principal purpose is large-scale production rather than production intended for information-gathering, analysis or the testing of equipment or plant.”

## Appendix I: Comparative analysis of royalty and profit-share payment mechanisms

	<b>Mechanism:</b>	<b>Ad valorem royalty</b>	<b>Profit-share</b>
<b>Objective (Convention*)</b>	<b>Commentary</b>		
To ensure optimum revenues for the Authority from the proceeds of commercial production	Optimum revenues to the Authority means that the Authority should secure the highest level of revenue return with a range of scenarios and sensitivities (e.g. metal prices), taking in account the remaining objectives and principles set out in the Convention and in the 1994 Implementing Agreement. These include the need to attract investments and technology to the Area (commercial viability) and to be fair both to a contractor and to the Authority by the appropriate sharing of risk/reward between the Authority, contractor and sponsoring States	Assures a stable revenue flow (even where no profit), linked to metal prices. Can capture upside/downside in high/low-price environments	Delay in returns to the resource owner from the proceeds of production. When a contractor may temporarily be making a loss, no payments are due to the resource owner  Potential for upside (longer term). Considered more economically efficient than royalty in mature industries
To attract investments and technology to the exploration and exploitation of the Area	Attracting investment and technology to the exploration and exploitation of the Area means that the Authority must create a competitive investment climate (commercial viability). With an unproven regulatory framework and immature technology, the risks for a contractor are currently at its highest, however, as the industry matures, risks decline, and commercial viability is proven.	Seen as more predictable, stable and easier to monitor / forecast. Can be regressive particularly for marginal mine developments	Seen as more progressive in nature by taking account of development and other costs, requiring a level playing field
That contractors receive equal treatment and have comparable financial obligations	There are a number of different entities that will be involved in the extractive process, namely States parties, State enterprises, the Enterprise and natural persons, including private investors. This objective is to ensure consistent treatment and a level-playing field across the contractor base. While the development of the resources of the Area must take place in accordance with sound commercial principles, different goals and drivers (strategic versus commercial) will become	More consistent treatment where a number of different entities engaged	Demands consistent / uniform rules and transparency (level playing field)

	<b>Mechanism:</b>	<b>Ad valorem royalty</b>	<b>Profit-share</b>
	apparent; a mechanism that takes accounts of these considerations is preferable.		
<b>Principles (1994 Agreement*)</b>			
The system of payments to the Authority shall be fair both to a contractor and to the Authority	Uniform application is preferable. Should be an element of stable income flows throughout life-cycle. Longer term flexibility to respond to profitability. Certainty and predictability of mechanism also key factors.	More stable, less flexible to respond to profitability but reflects underlying commodity price	Reflects individual contractor cost base
The system is also to provide adequate means of determining compliance by the contractor	The greater the complexity of the mechanism, the potentially less attractive. Administration costs to be minimized. Transparency of and in reporting an important factor.	More transparent and more readily auditable / verifiable	Difficult to monitor. Less visibility and potential for accounting manipulation
Any payment mechanism should not be complicated to administer for both the contractor and the Authority		Administratively simpler than profit-based	Higher compliance costs

\* See Annex III, Article 13(1) of the Convention and Annex, Section 8 of the 1994 Agreement.

## Appendix II: Table of results for contractor IRR, ISA and other shares extracted from MIT Report

System	Ad-Val Rate (Stage 1 and 2)	Stage 2 Royalty or Profit Rate <sup>10</sup>	Contractor IRR *	ISA NPV ** (2.27%) <sup>11</sup>	ISA NPV ** (10%)	Cumulative ISA Share (US\$m)	Cumulative Sponsoring State Share (US\$m)	Other Share (Fund) (US\$m) ***	Cumulative Contractor Share (US\$m)	ISA Share	Sponsoring State Share	Other Share (Fund)***	Contractor Share
AV6% / AV6%	6%	6%	17%	2,600	600	4,300	3,600	500	10,400	23%	19%	3%	55%
AV3% / AV8%	3%	8%	17%	3,150	660	5,300	3,300	500	9,700	28%	18%	3%	51%
AV3% + PB20%	3%	20%	17%	3,160	644	5,300	3,200	500	9,200	29%	17%	3%	51%
AV4% / AV4%	4%	4%	17.5%	1,730	400	2,900	3,700	500	10,932	16%	21%	3%	60%
AV2% / AV6%	2%	6%	17.5%	2,350	490	4,000	3,450	500	10,180	22%	19%	3%	56%
AV2% + PB15%	2%	15%	17.5%	2,270	470	3,850	3,460	500	10,258	21%	19%	3%	57%
AV2% / AV2%	2%	2%	18%	870	200	1,450	3,900	500	11,450	8%	23%	3%	66%
AV1% / AV3.5%	1%	3.5%	18%	1,360	280	2,300	3,600	500	10,800	13%	21%	3%	63%
AV1% + PB10%	1%	10%	18%	1,370	280	2,400	3,800	500	11,400	13%	21%	3%	63%

\* IRR: Internal Rate of Return

\*\* NPV: Net Present Value

\*\*\* The model assumes that the contractor pays the equivalent of 1% additional gross metal value which reflects the cost of contributions to an environmental fund (capped at US\$500m per project) and a range of other financial instruments.

<sup>10</sup> The switching point between the stage 1 and stage 2 ad valorem royalty or commencement of any profit share is of the order of 5 years being a mining entity break-even point (full cost recovery).

<sup>11</sup> Drupp, M., Freeman, M., Groom, B., Nesje, F., 2015. Discounting disentangled: an expert survey on the determinants of the long-term social discount rate (GRI Working Paper No. 196a). Grantham Research Institute on Climate Change and the Environment.

## **Appendix III: Review of system of payments and rates of payments**

### **Regulation 81**

#### **Review of system of payments**

1. The system of payments adopted under these Regulations and pursuant to paragraph 1 (c) of section 8 of the annex to the Agreement shall be reviewed by the Council five years from the first date of commencement of Commercial Production in the Area and at intervals thereafter as determined by the Council, taking into account the level of maturity and development of Exploitation activities in the Area.
2. The Council, based on the recommendations of the Commission, and in consultation with Contractors, may revise the system of payments in the light of changing circumstances and following any review under paragraph 1 above, save that any revision shall only apply to existing exploitation contracts by agreement between the Authority and the Contractor.

### **Regulation 82**

#### **Review of rates of payments**

1. The rates of payments under an existing system of payments shall be reviewed by the Council five years from the first date of commencement of Commercial Production in the Area and at intervals thereafter as determined by the Council, taking into account the Resource category and the level of maturity and development of Exploitation activities in the Area.
2. The Council, based on the recommendations of the Commission and in consultation with Contractors, may adjust the rates of payments in the light of such recommendations and consultation, save that any adjustment to the rates of payments may only apply to existing exploitation contracts from the end of the Second Period of Commercial Production reflected in appendix IV to these Regulations.
3. Without limiting the scope of any review by the Council, a review under this regulation may include an adjustment to the Applicable Royalty Rate under appendix IV and the manner and basis of the calculation of a royalty

#### Appendix IV: Summary table of payments and fees under the draft exploitation regulations

Type of payment or fee	Organ(s) responsible	Ref. to draft regulations (DR)	Comments
<b>Payment mechanism</b>			
Liability to royalty	Council	DR 64 and Appendix IV	See Appendix II
Annual fixed fee	Council	DR 85 (Section 8(1)(d) of the 1994 Agreement)	US\$1m assumed in MIT model, but subject to further consideration by the Commission (see ISBA/25/C/18 para. 33).
<b>Administrative (user/processing) fees</b>			
Application fee for approval of a Plan of Work	Council (acting on the recommendation of the Finance Committee)	Appendix II (DR 7 (3)(j))	US\$1m assumed in MIT model
Annual reporting fee		Appendix II (DR 84)	US\$0.1m assumed in MIT model
Renewal of an exploitation contract		Appendix II (DR 20)	Fees to be determined by the Council (acting on the recommendation of the Finance Committee) but assumed to be based on cost recovery and to reflect the actual costs of providing the services in question.
Transfer of an interest in an exploitation contract and approved Plan of Work		Appendix II (DR 23)	
Use of a contract or approved Plan of Work as security		Appendix II (DR 22)	
Temporary suspension in Commercial Production		Appendix II (DR 29)	
Modification to a Plan of Work		Appendix II (DR 57)	
Approval of a revised/final Closure Plan		Appendix II (DRs 59 (2) and 60)	
Approval of a revised Environmental Management and Monitoring Plan		Appendix II (DR 52 (8) (b))	
<b>Other</b>			
Environmental Performance Guarantee	To be specified in Guidelines	DR 26	Rationale and quantum to be determined. May vary between contractors depending upon the nature of the operation proposed.
Insurance	To be specified in Guidelines	DR 36	Insurance options to be explored further, particularly availability of environmental liability insurance and its impact on a compensation fund. Insurance would be a cost to the contractor and would necessarily vary according to market rates and contractor profile and would not require any additional payment to the Authority.
Environmental compensation fund	Council	DR 56	Parameters for use of fund and methodology for funding to be determined [1% gross metal value assumed in MIT model for the cost of maintaining a range of financial instruments including the environmental performance guarantee, insurance and an environmental compensation fund].
Monetary penalties	Council	DRs 80 and 103(6)	To be set out in a Council decision.